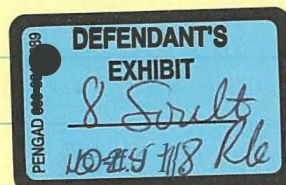


- Thank you

- 1/2 2

Modules supposed to make it simpler may complex

Feel Sorry, Take it down & put it up.



From: Powell, Allyn <ahpowell@regstaff.sc.gov>
Sent: Wednesday, March 2, 2016 10:22 AM
To: James, Anthony
Cc: Gary Jones; Sault, Gene
Subject: Final Presentation
Attachments: Presentation to Electric Cooperatives of SC 2016-03-03 FINAL.pdf;
Presentation to Electric Cooperatives of SC 2016-03-03 FINAL.pptx

Attached is Gary's final presentation with edits from this morning. My only comment is that I would still consider changing the title to include the words "Independent Assessment on Behalf of the South Carolina Office of Regulatory Staff", but that's up to you and Dukes,

Please let me know if there is anywhere else I need to send it.

Thanks!





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Status of the V. C. Summer Units 2 & 3 Nuclear Power Plants

Presentation to the Electric Cooperatives of South Carolina

Gary C. Jones, President of Jones Partners, Ltd.

March 3, 2016



Brief CV of Gary C. Jones

G.J.E-Mails.2016.Vol.1.002316



- ▶ 45+ years in the nuclear power industry
- ▶ 32 years with Sargent & Lundy (S&L) in Chicago, Illinois
- ▶ 16 years as an Owner/Senior Vice President of S&L
- ▶ 2 ½ years with the International Atomic Energy Agency (IAEA) in Vienna, Austria
- ▶ Led the design and engineering on 3 major nuclear power plants
 - ▶ LaSalle County (Commonwealth Edison)
 - ▶ Marble Hill (Public Service Indiana)
 - ▶ Braidwood (Commonwealth Edison)
- ▶ Provided engineering, design and consulting services to over 50 nuclear power plants in the United States
- ▶ Professional project experience in Armenia, Canada, China, El Salvador, Finland, Hungary, Mexico, South Korea and Ukraine as well as throughout the United States
- ▶ Retained by South Carolina Office of Regulatory Staff (ORS) since August 2011
- ▶ Registered Professional Engineer in Missouri and South Carolina

A Very Good Idea in 2008

G.J.E-Mails.2016.Vol.1.002317



Why?

- ▶ Updated NRC regulatory environment under 10 CFR 52, which allows for a combined license to both construct and operate a plant
- ▶ Modular Construction
- ▶ Certified Design
- ▶ Success in Asia
- ▶ Base Load Review Act (BLRA) in South Carolina
- ▶ Source of non-GHG emitting and diverse power
- ▶ Engineering, Procurement and Construction (EPC) Contract

Experience Since 2008

G.J.E-Mails.2016.Vol.11.002318



Regulatory environment not as good as hoped

- ▶ Combined Construction and Operating License (COL) was delayed
 - ▶ 9 months until March 30, 2012
- ▶ "Build what you license vs. license what you build"
- ▶ Very strict literal compliance via NRC oversight
- ▶ License Amendment Requests (LARs)
- ▶ First plants through the Inspection, Tests, Analyses and Acceptance Criteria (ITAAC) process
- ▶ Not as much credit for previous experience in China as hoped
- ▶ Impact of changes from Fukushima accident

Experience Since 2008

G.J.E-Mails.2016.Vol.11.002319



Modular Construction

- ▶ Fabricators unable to reliably meet schedule and quality requirements
- ▶ Continuing design changes
- ▶ Inadequate constructability reviews
- ▶ Reassignment and de-scoping of fabricators

Certified Design

- ▶ Not as complete as anticipated
- ▶ Lessons learned at Chinese and sister plants
- ▶ Compliance issues with codes, standards and commitments
- ▶ SCE&G requested changes

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002320



Asian Schedules Could Not Be Duplicated

- ▶ More rigorous regulatory environment
- ▶ Construction productivity rates lower than planned

BLRA Remains an Essential Element to Success

- ▶ Stable environment ensures project financing
- ▶ Independent study shows plant is still a positive

Still a Source of Non-GHG Emitting Power

- ▶ More focus on this issue due to EPA 111kd
- ▶ Diversity in power supply remains important

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002321



EPC Contract

- ▶ Multiple Changes in Ownership
 - ▶ Westinghouse/Shaw Stone & Webster
 - ▶ Westinghouse/CB&I Stone & Webster
 - ▶ Westinghouse (with Fluor as a sub-contracted construction manager)
- ▶ Multiple Amendments
- ▶ "Change in Law" provision interpretation led to disagreements
- ▶ Designer vs. Constructor

Current Status

G.J.E-Mails.2016.Vol.1.002322



Most of the following information is taken directly from a December 9, 2015 SCANA presentation at the 2015 Wells Fargo Energy Symposium. Some information, including the photograph on the first slide, was taken from a presentation given by SCANA on its February 18, 2015 Fourth Quarter and Full Year 2015 Earnings Conference Call.

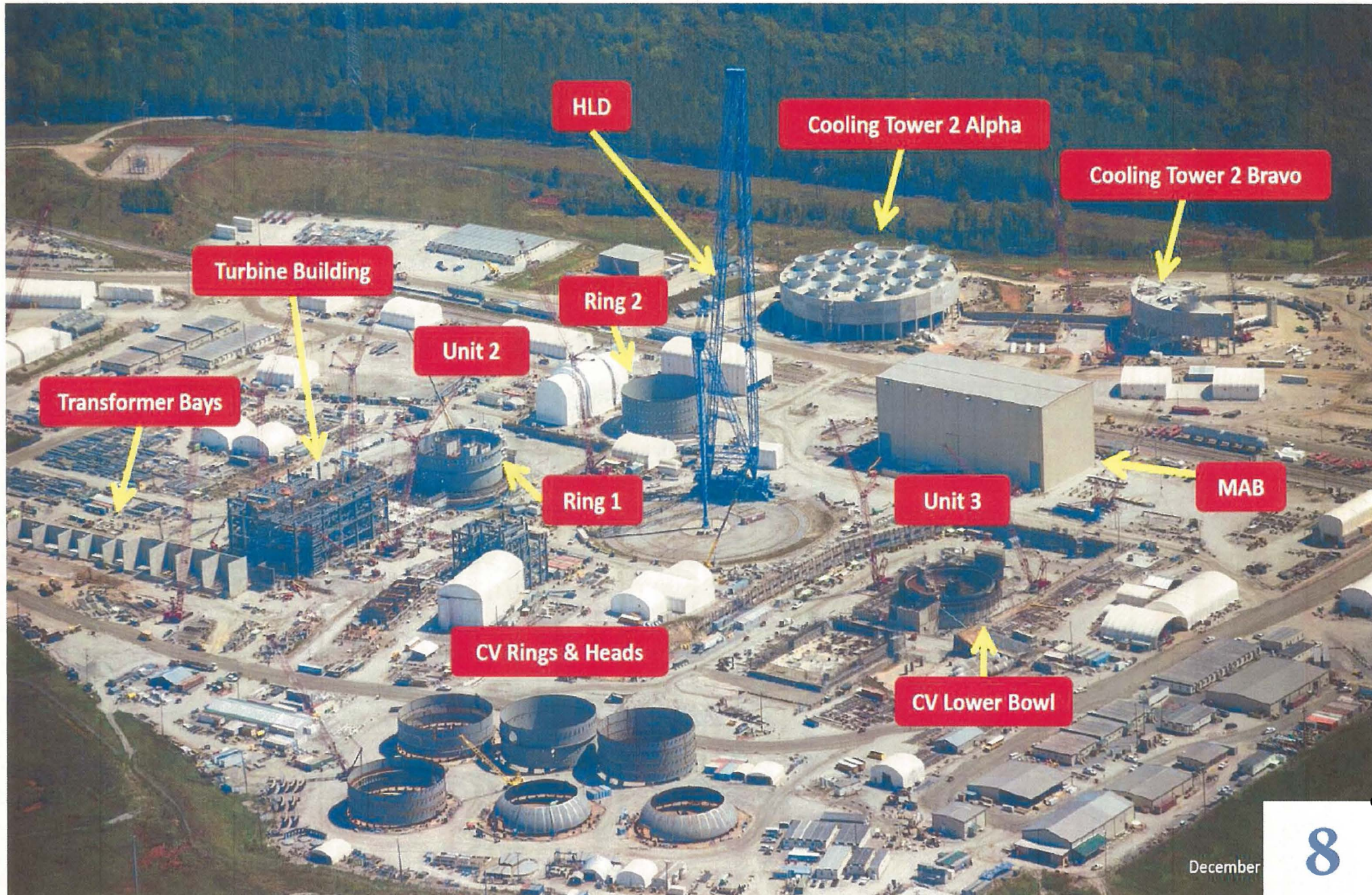
These presentations are available from the SCANA website at

www.scana.com/investors/webcasts-presentations

Site Overview

G.J.E-Mails.2016.Vol.1.002323

(Picture from September 2015)

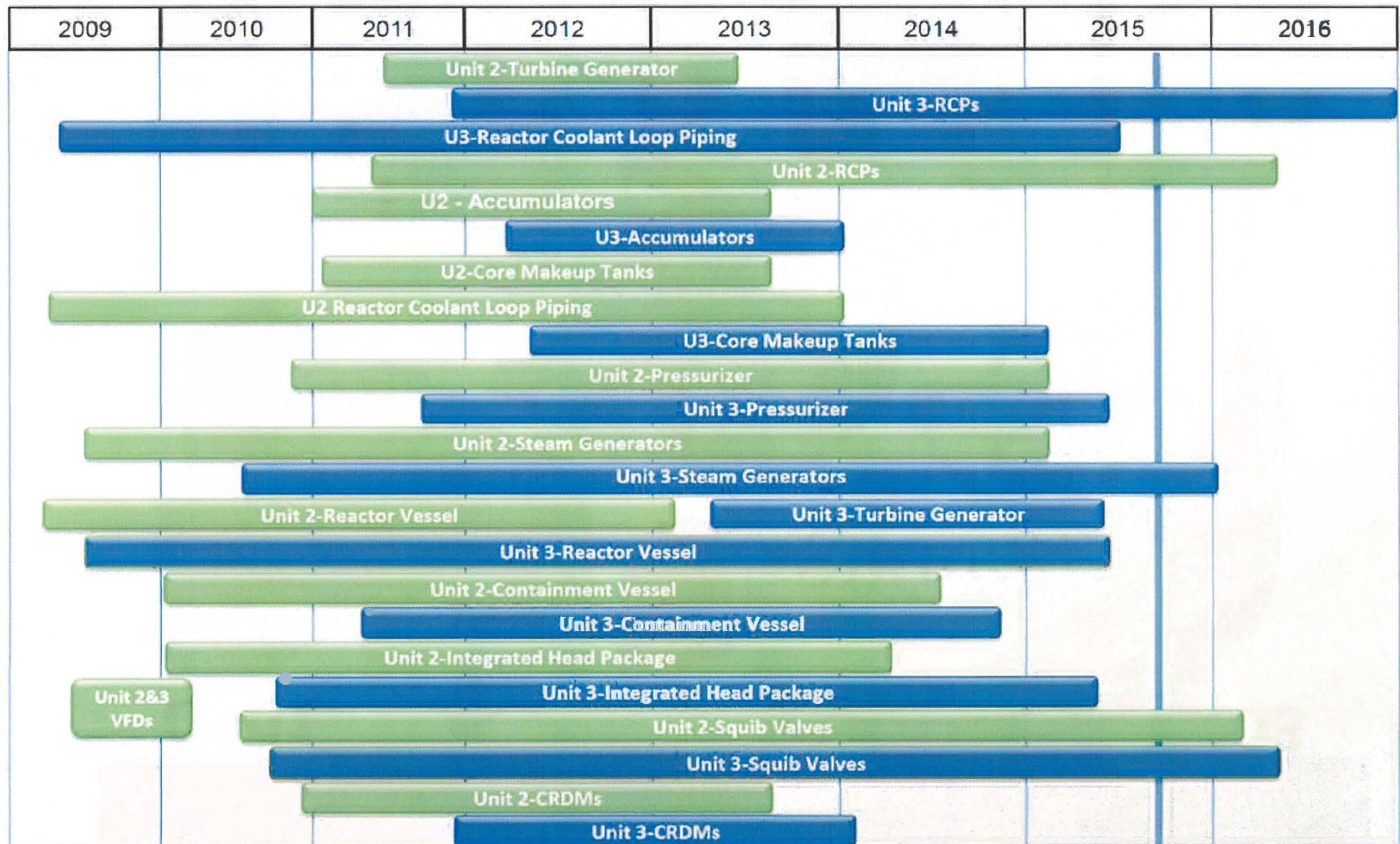


December

8

Status of Major Equipment

CPM, B. Mails 2016, Vol. 1, 002324

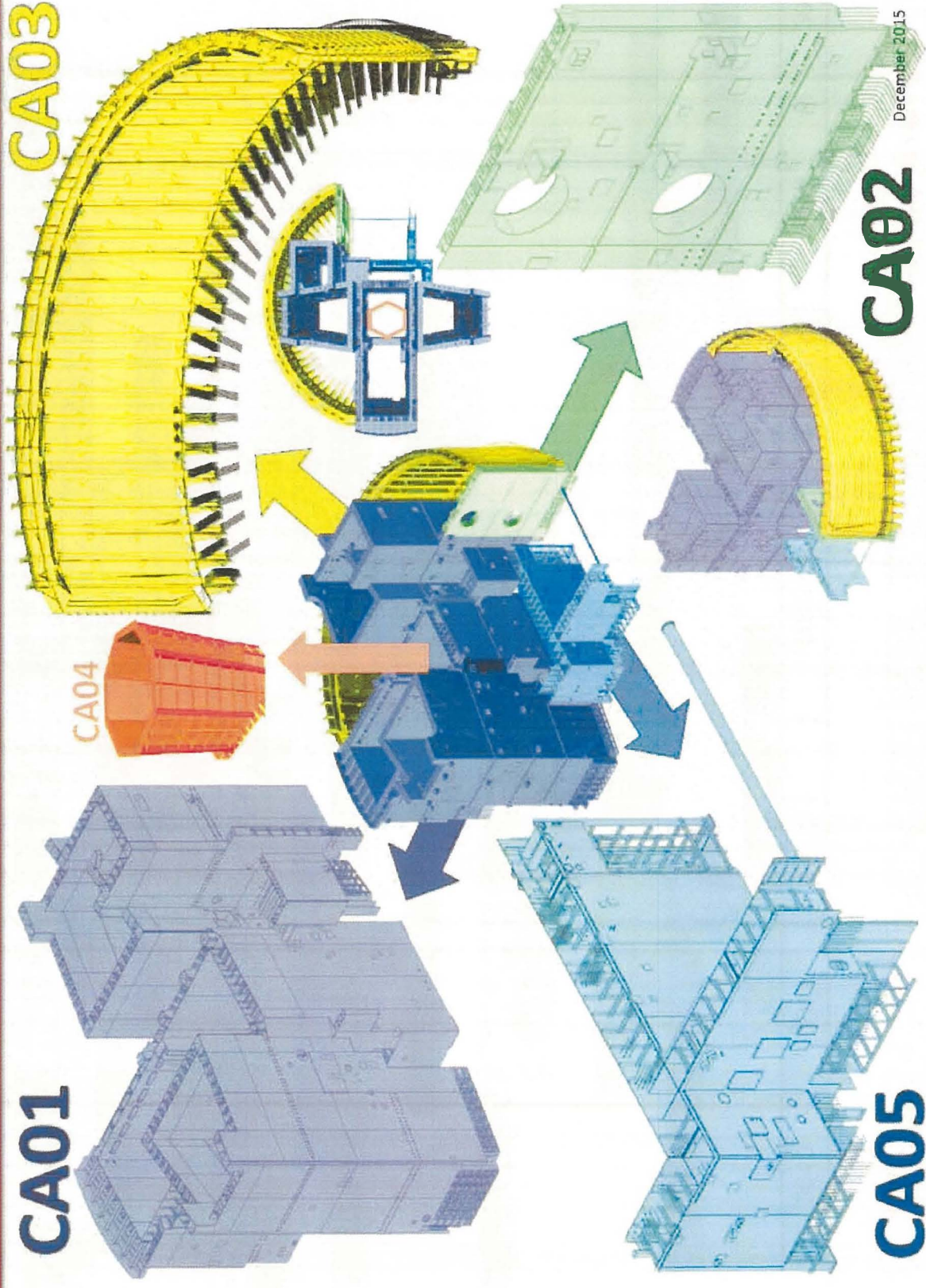


Current Position December

“Big Five” Modules Inside Enpointment

5/11/2018 3:11 PM V.1.002325

CA Modules

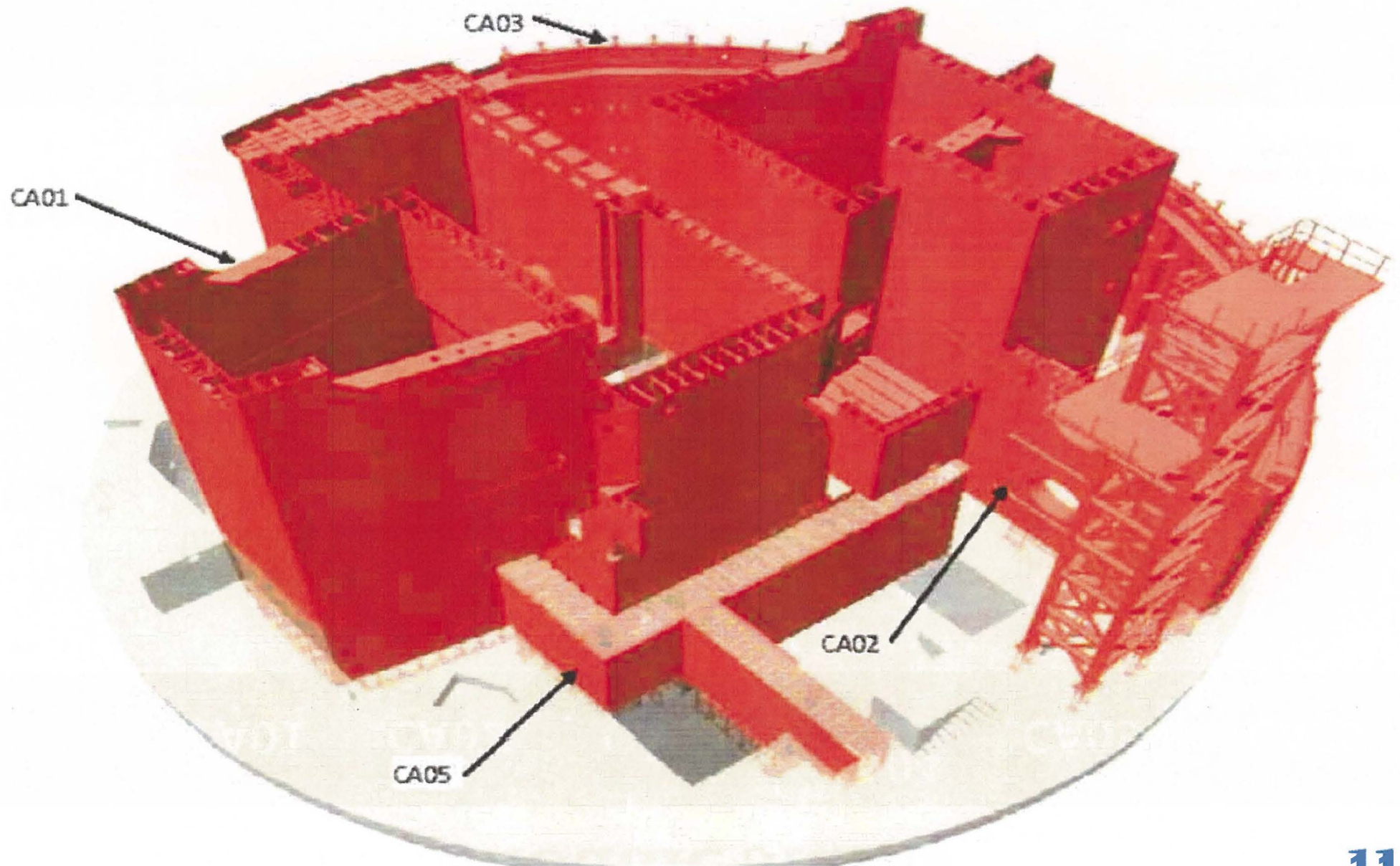


December 2015

10

“Big Five” Assembled

G.J.E-Mails.2016.Vol.1.002326



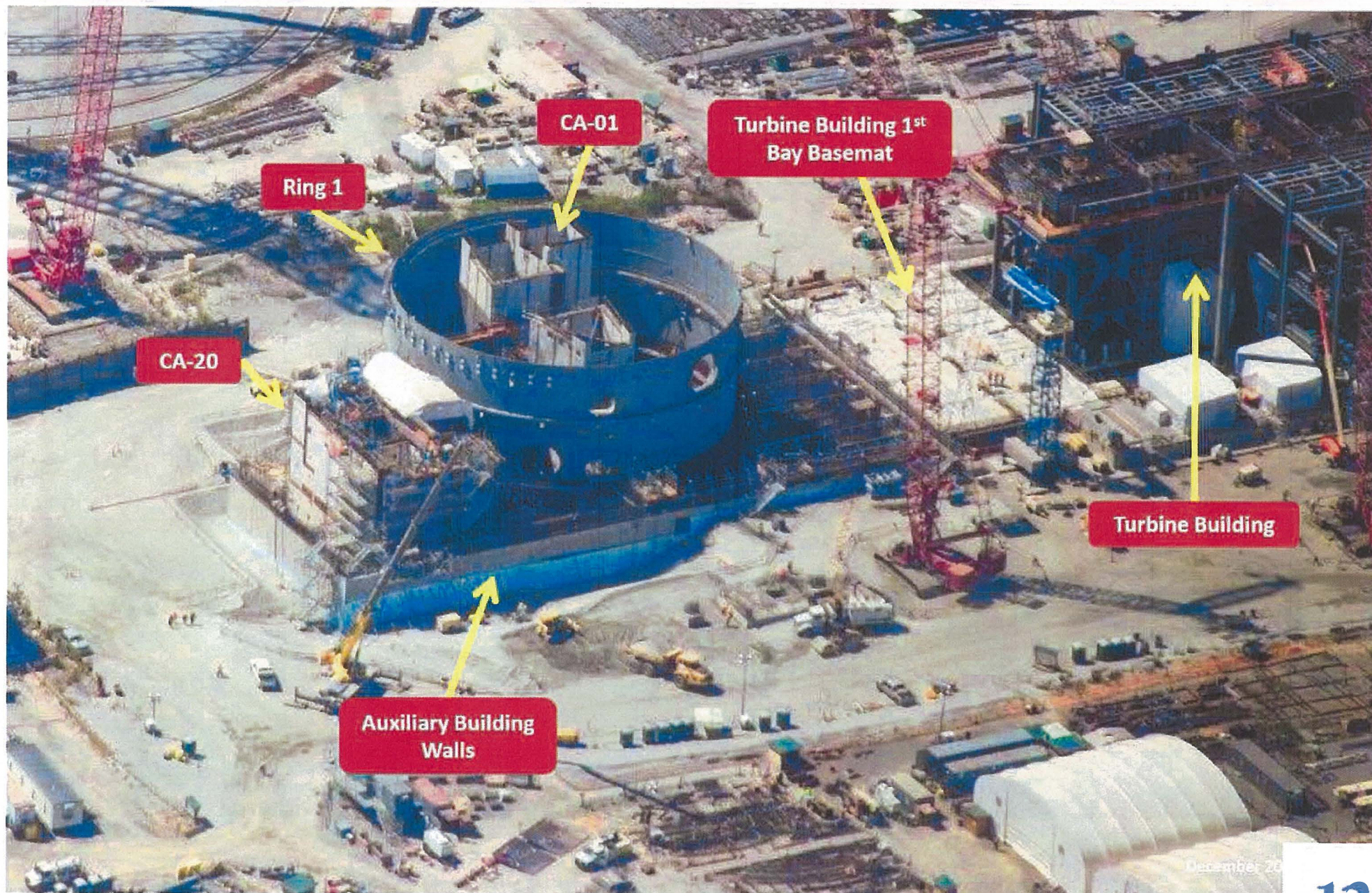
Module Status

G.J.E-Mails.2016.Vol.11.002327

	CA01	CA02	CA03	CA04 (No Concrete Required)	CA05	CA20
Unit 2	Installed Concrete fill to be determined.	Assembly Completed	17/17 sub-modules on site. 12/17 sub-modules on assembly platen. 3 sub-modules under on-site repair. Ready for hook June 2016.	Installed	Installed Concrete fill to be determined.	Installed Concrete fill is scheduled for April 2016
Unit 3	17/47 on-site. 6/47 on platen. Ready for hook in November 2016.	0/5 on-site.	0/17 on-site.	Installed	Assembly Completed Ready for hook in December 2016	68/72 on-site 22/72 on platen. Ready for hook in April 2016.
	Inside of Containment					Outside of Containment

Unit 2 Nuclear Island

E-J-E-Mails.2016.Vol.1.002328



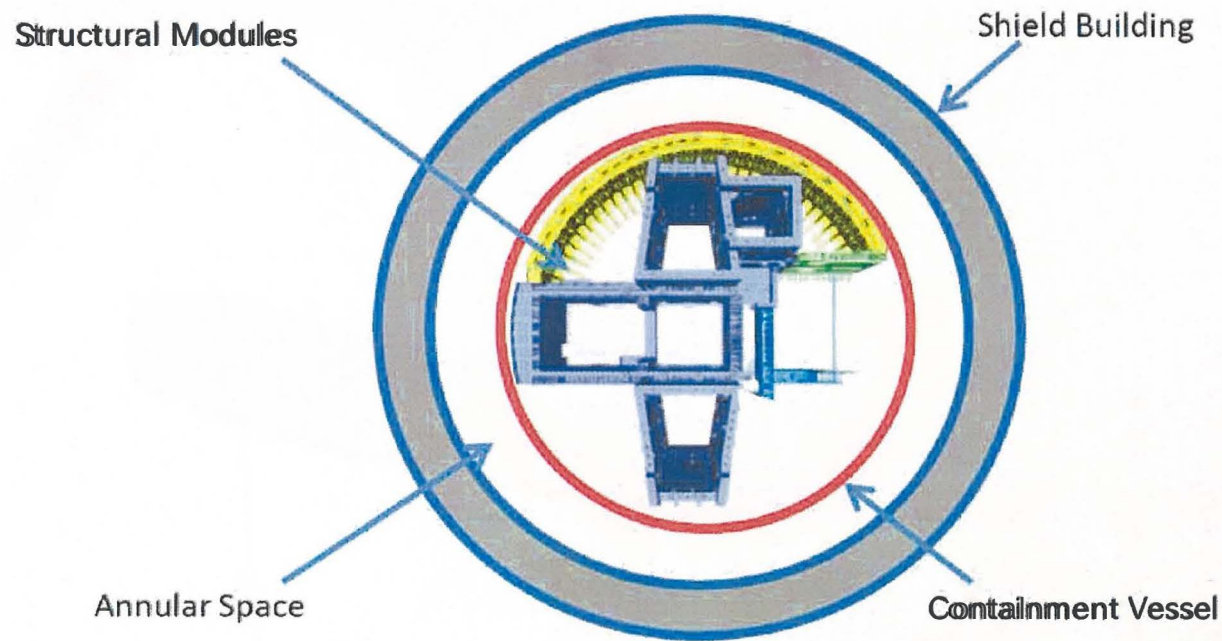
Unit 3 Nuclear Island

CEM-1-2016-VOL1002329
G. H. White, 2016, Vol. 1002329



Shield Building/Containment Vessel

SGS E-Mails 2018, Vol 1, 003320



Unit 2 Shield Building Assembly



Shield Building Panel Status

G.J.E-Mails.2016.Vol.1.002332

Unit 2

- ▶ 113/167 panels on-site
- ▶ Courses 01 and 02 installed and filled with concrete
- ▶ Course 03 installation underway
- ▶ 16 courses in total

Unit 3

- ▶ 36/167 panels on-site
- ▶ None yet installed

SCE&G's Settlement with the Consortium

G.J.E-Mails 2016.0611.002338

	Order #2015-661 (Prior EPC)	Amended EPC	Fixed Price Option
Guaranteed Substantial Completion Dates	Unit 2 - June 2019 Unit 3 - June 2020	Unit 2 - August 2019 Unit 3 - August 2020	
Capital Cost (SCE&G 55% share)	\$5.247 billion	\$5.492 billion	\$6.757 billion
Future Escalation to Westinghouse as 6/30/2015*:	\$794 million	\$813 million	\$19 million*
Total Expected Project Cost (SCE&G 55% share)	\$6.827 billion	\$7.113 billion	\$7.601 billion
Liquidated Damages	\$155 million @ 100% \$86 million - SCE&G	\$926 million @ 100% \$509 million - SCE&G	\$676 million @ 100% \$372 million - SCE&G
Bonuses	Capacity Performance Related	Completion - Capacity Performance bonus removed \$550 million @ 100% \$303 million - SCE&G	\$300 million @ 100% \$165 million - SCE&G
Change in Law Language	Generally defined	Explicitly defined - Formal written adoption of a new statute, regulation, requirement, or code or new NRC regulatory requirement that did not exist as of this amendment	

*The Fixed Price Option, regardless of date of acceptance, would fix Project Costs and shift the risk of escalation (excluding escalation on owner's and transmission costs) to Westinghouse as of June 30, 2015. Total Gross Escalation recorded as of 6/30/2015 is \$386 million. Under the Fixed Price Option, Total Gross Escalation remaining on the project is estimated to be approximately \$145 million.



Project Challenges

G.J.E-Mails.2016.Vol.11.002334



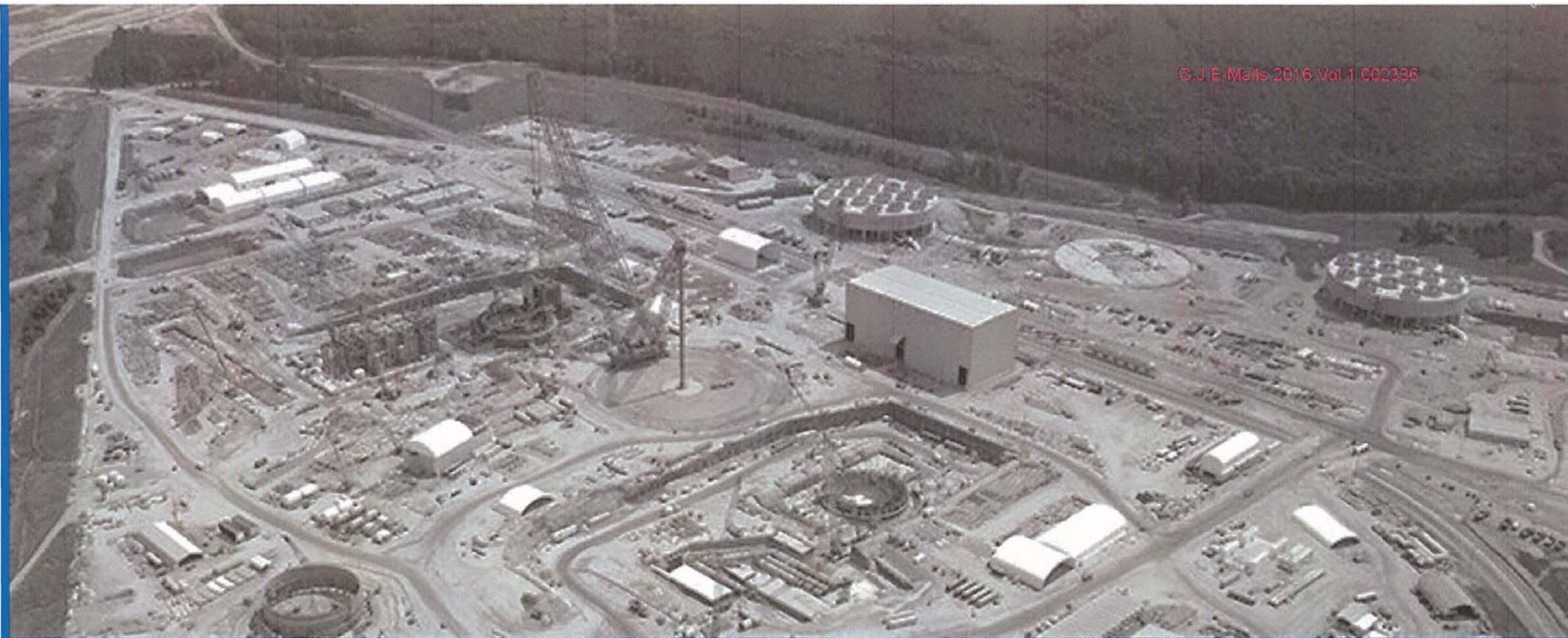
- ▶ **Transition Between EPC Contract Holders and Construction Management**
- ▶ **Modules, Modules, Modules!**
- ▶ **Shield Building Air Inlet Tension Ring and Roof Design**
- ▶ **Productivity**
- ▶ **Mechanical, Electrical and Instrumentation & Controls Installation**
- ▶ **Regulatory Compliance**
 - ▶ **License Amendment Requests (LARs)**
 - ▶ **ITAAC (873/unit required; 19 on U2 and 16 on U3 verified by NRC)**
- ▶ **Start-Up**
- ▶ **Operations and Support Staff Readiness**

Conclusions

G.J.E-Mails.2016.Vol.1.002335



- ▶ **Recent independent study indicates BLRA methodology reduces costs**
- ▶ **Still a diverse and non-GHG source of power**
- ▶ **Project faces significant, but not insurmountable, challenges**
- ▶ **Unit 3 will need substantial improvement in all areas to meet the date for federal tax credits**
- ▶ **Progress has been made in the general areas of the site and the turbine island**
- ▶ **Consolidation under Westinghouse is viewed positively by SCE&G**
- ▶ **Addition of Fluor should also be positive**



Status of the V. C. Summer Units **2 & 3** Nuclear Power Plants

Presentation to the Electric Cooperatives of South Carolina

Gary C. Jones, President of Jones Partners, Ltd.

March 3, 2016



Brief CV of Gary C. Jones

G.J.E-Mails.2016.Vol.11.002337



- ▶ 45+ years in the nuclear power industry
- ▶ 32 years with Sargent & Lundy (S&L) in Chicago, Illinois
- ▶ 16 years as an Owner/Senior Vice President of S&L
- ▶ 2 1/2 years with the International Atomic Energy Agency (IAEA) in Vienna, Austria
- ▶ Led the design and engineering on 3 major nuclear power plants
 - ▶ LaSalle County (Commonwealth Edison)
 - ▶ Marble Hill (Public Service Indiana)
 - ▶ Braidwood (Commonwealth Edison)
- ▶ Provided engineering, design and consulting services to over 50 nuclear power plants in the United States
- ▶ Professional project experience in Armenia, Canada, China, El Salvador, Finland, Hungary, Mexico, South Korea and Ukraine as well as throughout the United States
- ▶ Retained by South Carolina Office of Regulatory Staff (ORS) since August 2011
- ▶ Registered Professional Engineer in Missouri and South Carolina

A Very Good Idea in 2008

G.J.E-Mails.2016.Vol.1.002338



Why?

- ▶ Updated NRC regulatory environment under 10 CFR 52, which allows for a combined license to both construct and operate a plant
- ▶ Modular Construction
- ▶ Certified Design
- ▶ Success in Asia
- ▶ Base Load Review Act (BLRA) in South Carolina
- ▶ Source of non-GHG emitting and diverse power
- ▶ Engineering, Procurement and Construction (EPC) Contract

Experience Since 2008

G.J.E-Mails.2016.Vol.11.002339



Regulatory environment not as good as hoped

- ▶ Combined Construction and Operating License (COL) was delayed
 - ▶ 9 months until March 30, 2012
- ▶ "Build what you license vs. license what you build,"
- ▶ Very strict literal compliance via NRC oversight
- ▶ License Amendment Requests (LARs)
- ▶ First plants through the Inspection, Tests, Analyses and Acceptance Criteria (ITAAC) process
- ▶ Not as much credit for previous experience in China as hoped
- ▶ Impact of changes from Fukushima accident

Experience Since 2008

G.J.E-Mails.2016.Vol.11.002340



Modular Construction

- ▶ Fabricators unable to reliably meet schedule and quality requirements
- ▶ Continuing design changes
- ▶ Inadequate constructability reviews
- ▶ Reassignment and de-scoping of fabricators

Certified Design

- ▶ Not as complete as anticipated
- ▶ Lessons learned at Chinese and sister plants
- ▶ Compliance issues with codes, standards and commitments
- ▶ SCE&G requested changes

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002341



Asian Schedules Could Not Be Duplicated

- ▶ More rigorous regulatory environment
- ▶ Construction productivity rates lower than planned

BLRA Remains an Essential Element to Success

- ▶ Stable environment ensures project financing
- ▶ Independent study shows plant is still a positive

Still a Source of Non-GHG Emitting Power

- ▶ More focus on this issue due to EPA 111d
- ▶ Diversity in power supply remains important

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002342



EPC Contract

- ▶ Multiple Changes in Ownership
 - ▶ Westinghouse/Shaw Stone & Webster
 - ▶ Westinghouse/CB&I Stone & Webster
 - ▶ Westinghouse (with Fluor as a sub-contracted construction manager)
- ▶ Multiple Amendments
- ▶ "Change in Law" provision interpretation led to disagreements
- ▶ Designer vs. Constructor

Current Status

G.J.E-Mails.2016.Vol.1.002343



Most of the following information is taken directly from a December 9, 2015 SCANA presentation at the 2015 Wells Fargo Energy Symposium. Some information, including the photograph on the first slide, was taken from a presentation given by SCANA on its February 18, 2015 Fourth Quarter and Full Year 2015 Earnings Conference Call.

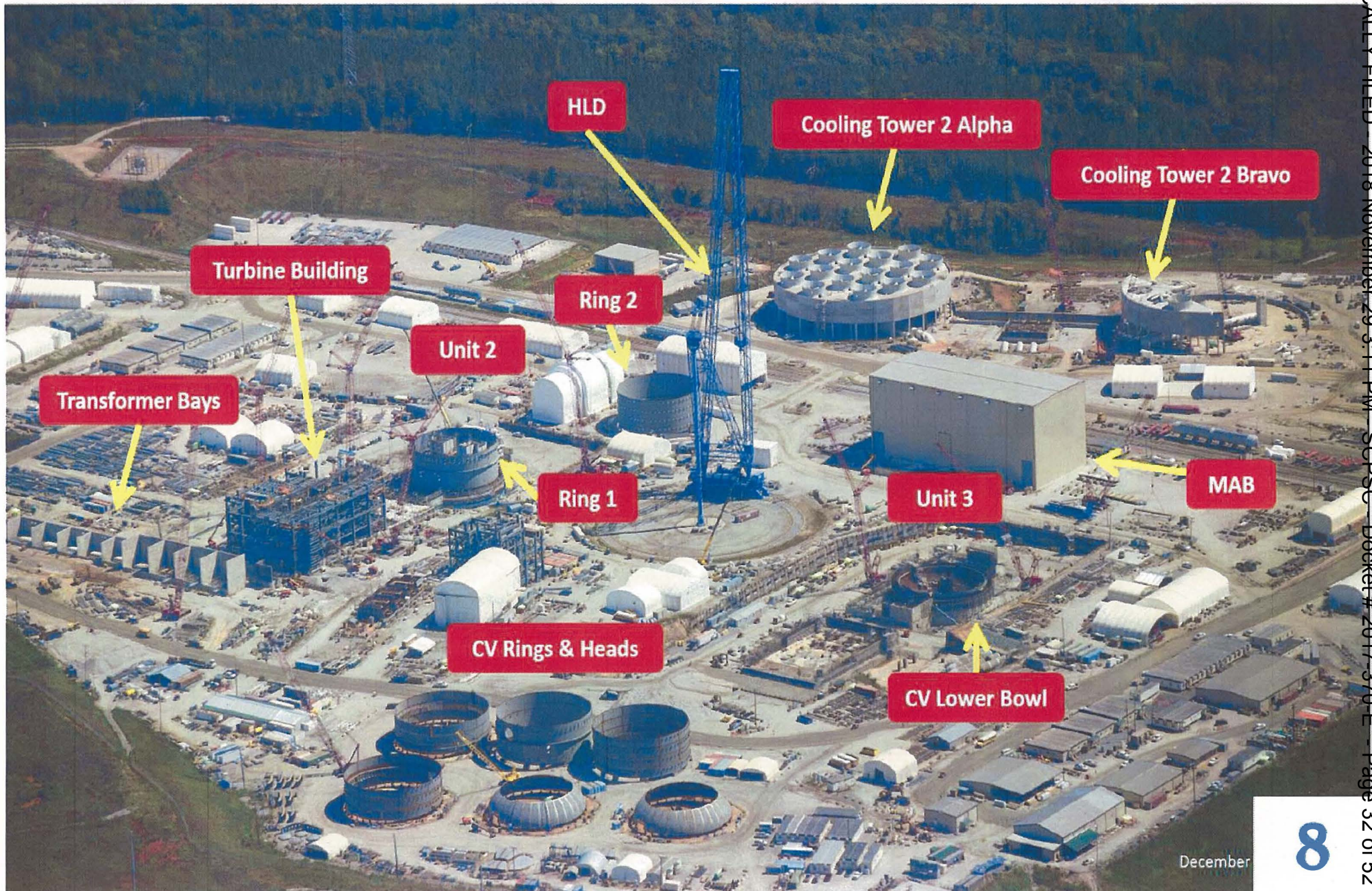
These presentations are available from the SCANA website at

www.scana.com/investors/webcasts-presentations

Site Overview

(Picture from September 2015)

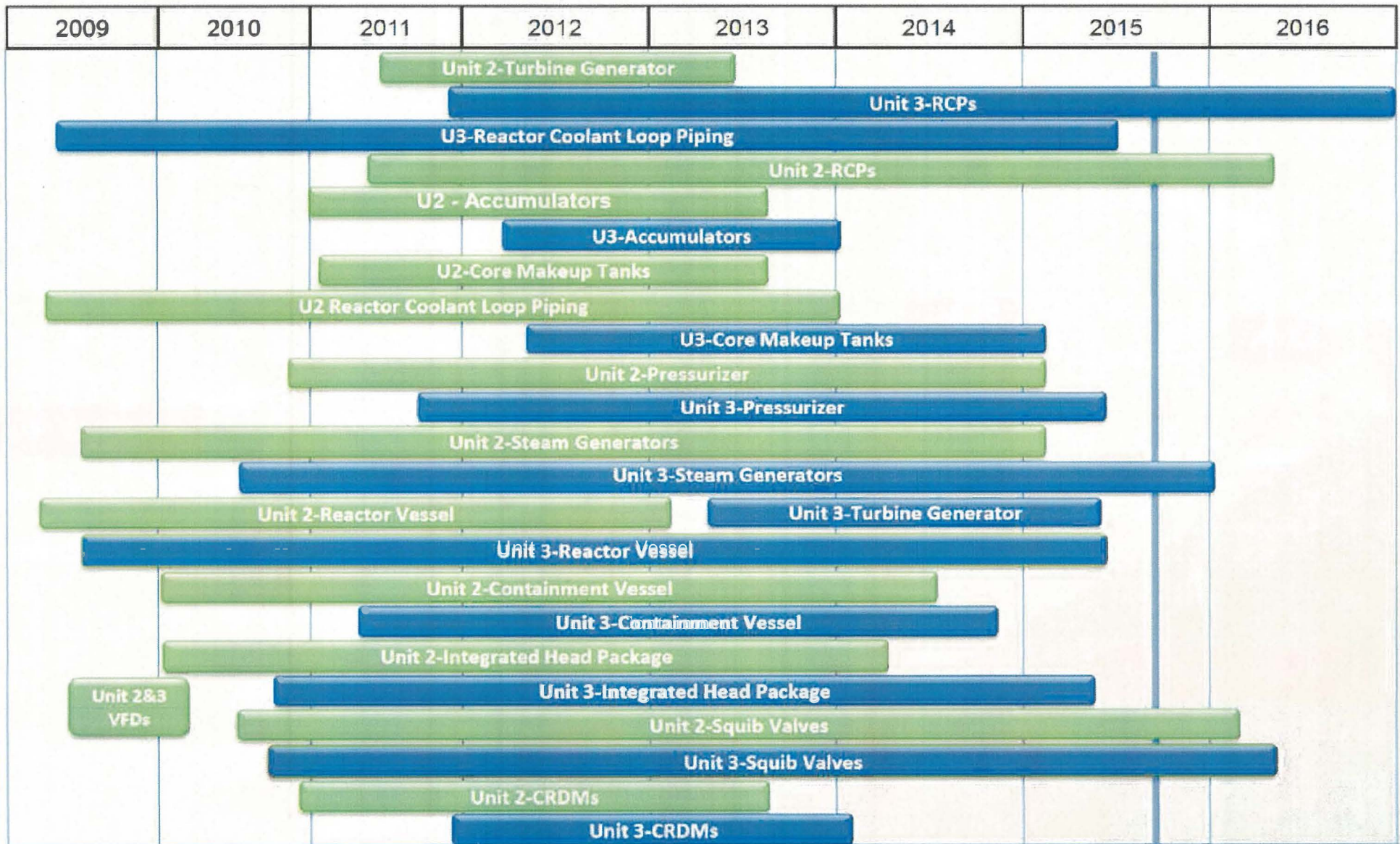
G.J.E-Mails.2016. Vol.1.002344



December

Status of Major Equipment

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 E. E. Nilsen, Jr. Vol. 1, 002145

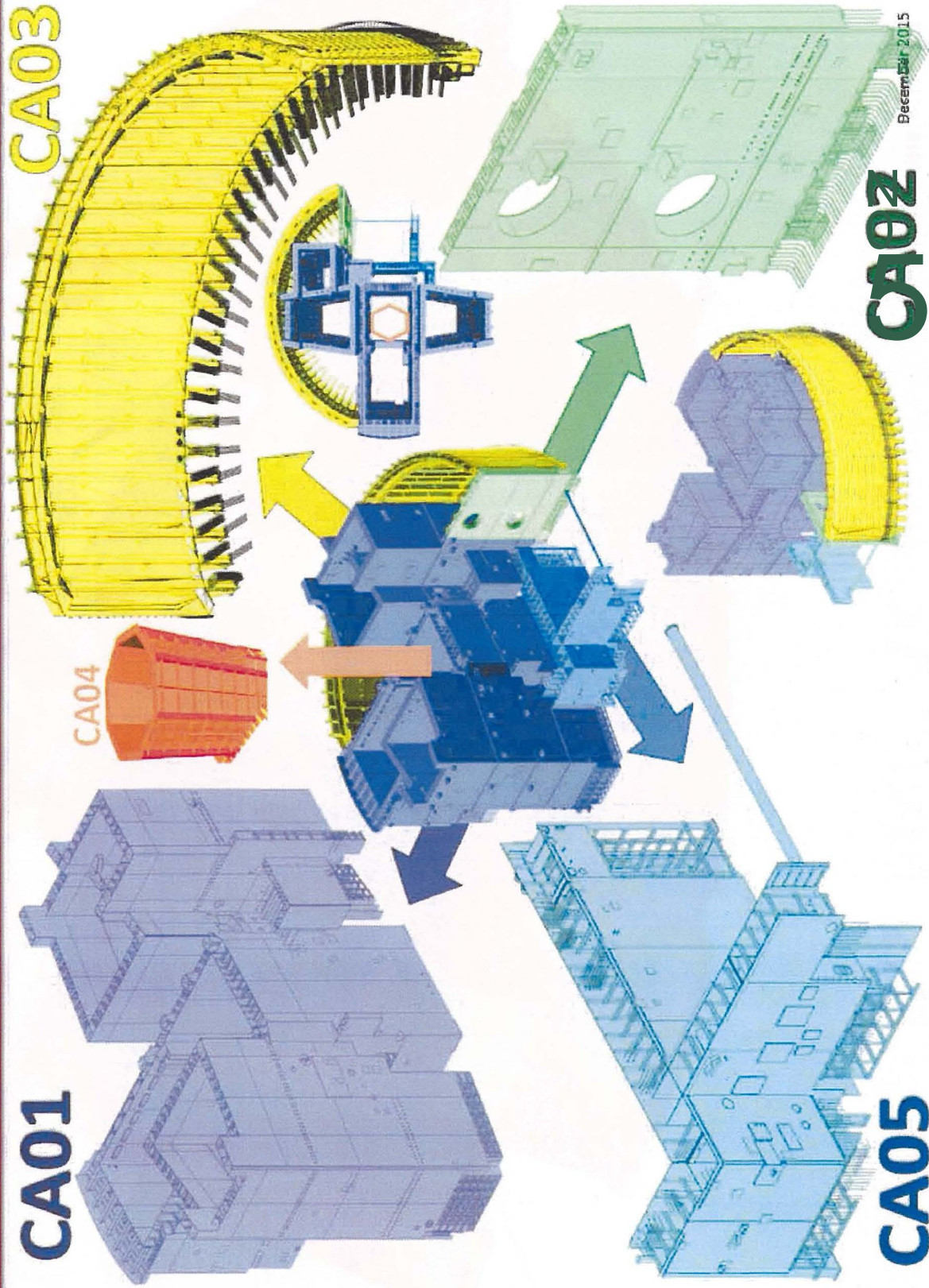


December
 Current Position

“Big Five” Modules Inside Equipment

FILED - 2018 November 29 3:11 PM - SCPSC - Docket # 2017-370-E - Page 34 of 52

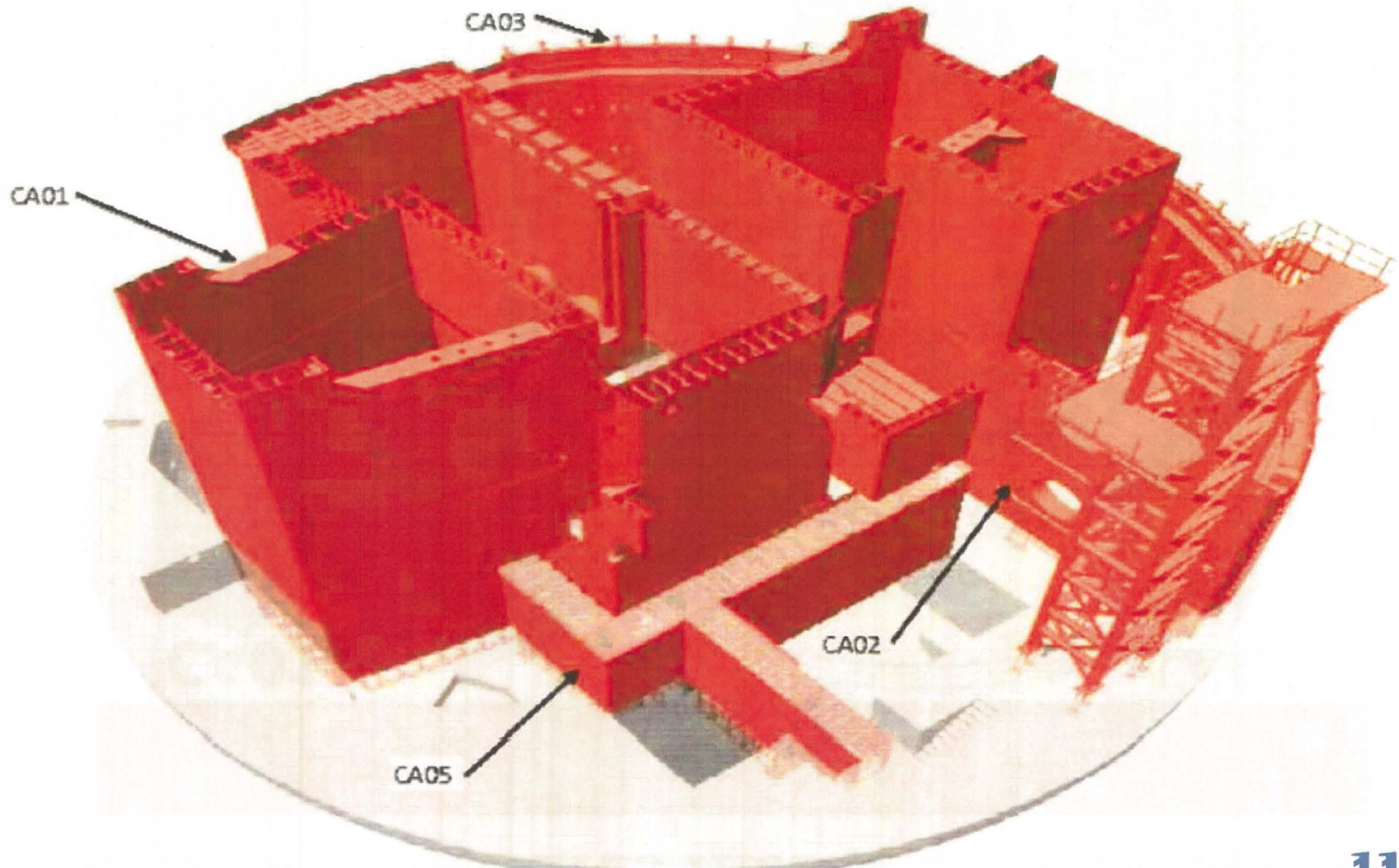
CA Modules



December 2015

"Big Five" Assembled

G.J.E-Mails.2016.Vol.1.002347



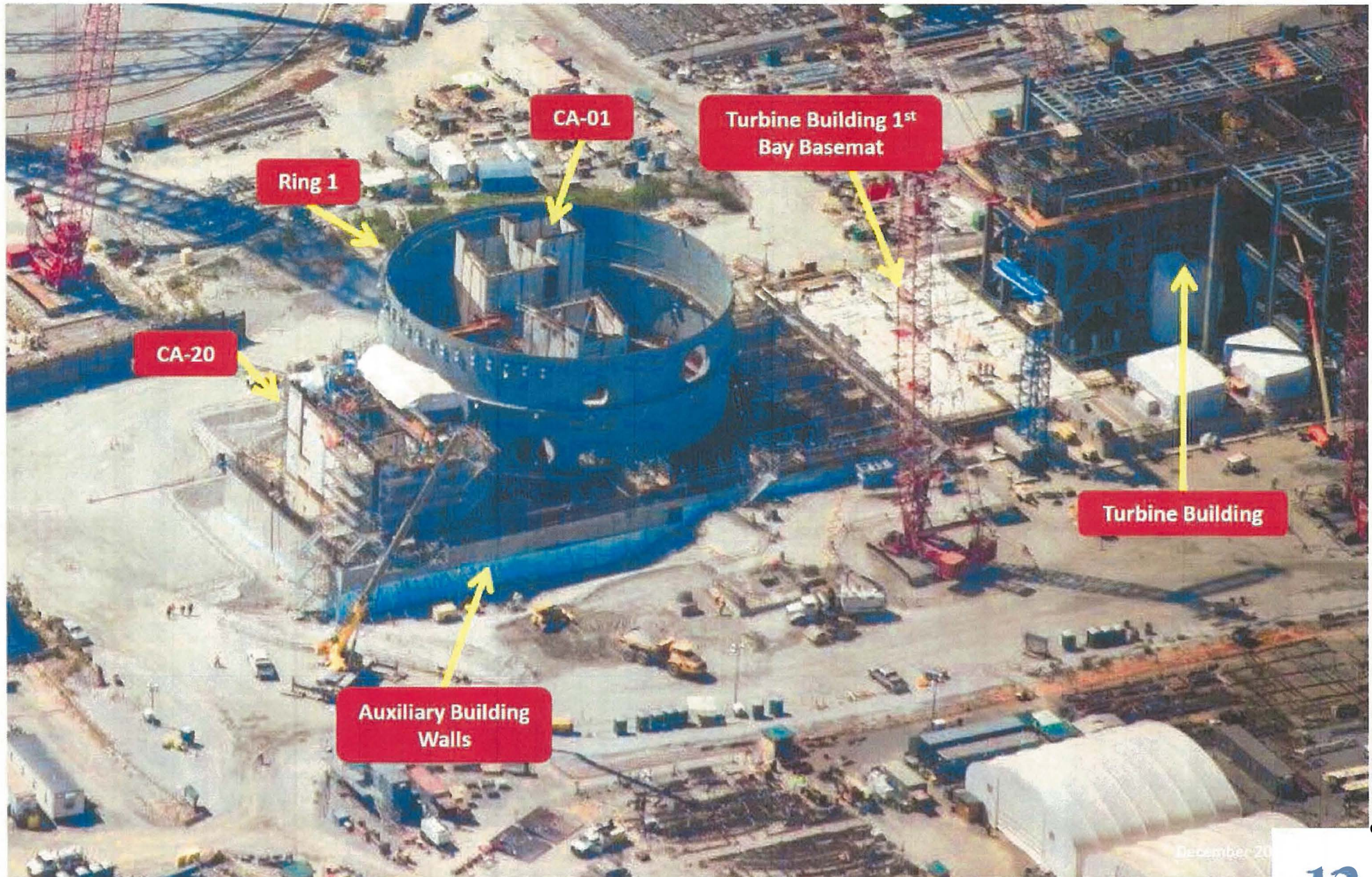
Module Status

G.J.E-Mails.2016.Vol.1.002348

	CA01	CA02	CA03	CA04 (No Concrete Required)	CA05	CA20
Unit 2	Installed Concrete fill to be determined.	Assembly Completed	17/17 sub-modules on site. 12/17 sub-modules on assembly platen. 3 sub-modules under on-site repair. Ready for hook June 2016.	Installed	Installed Concrete fill to be determined.	Installed Concrete fill is scheduled for April 2016
Unit 3	17/47 on-site. 6/47 on platen. Ready for hook in November 2016.	0/5 on-site.	0/17 on-site.	Installed	Assembly Completed Ready for hook in December 2016	68/72 on-site 22/72 on platen. Ready for hook in April 2016.
	Inside of Containment					Outside of Containment

Unit 2 Nuclear Island

EW-2016-01-002349



Unit 3 Nuclear Island

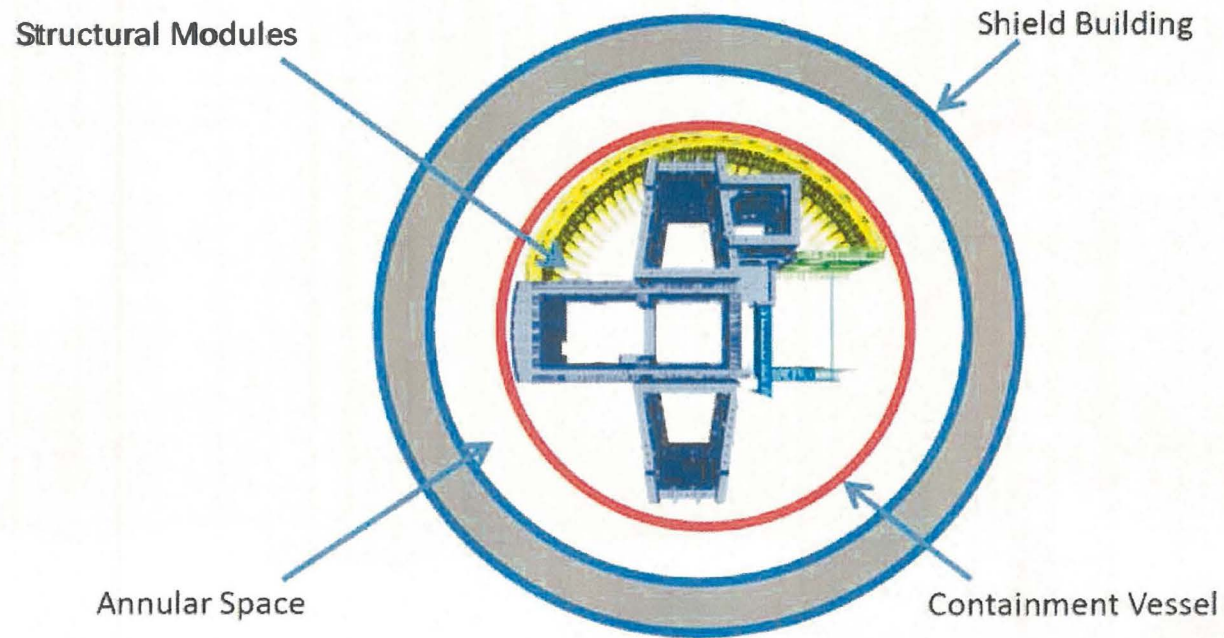
GJEM: 2016, Vol. 00, J5C
E-Files, 2016, Vol. 00, J5C



December 2015

Shield Building/Containment Vessel

G.E.-Mails/2013/Vol.1/002351



Unit 2 Shield Building Assembly



Shield Building Panel Status

G.J.E-Mails.2016.Vol.1.002353

Unit 2

- ▶ 113/167 panels on-site
- ▶ Courses 01 and 02 installed and filled with concrete
- ▶ Course 03 installation underway
- ▶ 16 courses in total

Unit 3

- ▶ 36/167 panels on-site
- ▶ None yet installed

SCE&G's Settlement with the Consortium

	Order #2015-661 (Prior EPC)	Amended EPC	Fixed Price Option
Guaranteed Substantial Completion Dates	Unit 2 - June 2019 Unit 3- June 2020	Unit 2 - August 2019 Unit 3- August 2020	
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Future Escalation to Westinghouse as 6/30/2015*:	\$794 million	\$813 million	\$19 million*
Total Expected Project Cost (SCE&G 55% share)	\$6.827 billion	\$7.113 billion	\$7.601 billion
Liquidated Damages	\$155 million @ 100% \$86 million - SCE&G	\$926 million @ 100% \$509 million - SCE&G	\$676 million @ 100% \$372 million - SCE&G
Bonuses	Capacity Performance Related	Completion - Capacity Performance bonus removed \$550 million @ 100% \$303 million - SCE&G	\$300 million @ 100% \$165 million - SCE&G
Change in Law Language	Generally defined	Explicitly defined- Formal written adoption of a new statute, regulation, requirement, or code or new NRC regulatory requirement that did not exist as of this amendment	

*The Fixed Price Option, regardless of date of acceptance, would fix Project Costs and shift the risk of escalation (excluding escalation on owner's and transmission costs) to Westinghouse as of June 30, 2015. Total Gross Escalation recorded as of 6/30/2015 is \$386 million. Under the Fixed Price Option, Total Gross Escalation remaining on the project is estimated to be approximately \$145 million.

Project Challenges

G.J.E-Mails.2016.Vol.1.002355



- ▶ **Transition Between EPC Contract Holders and Construction Management**
- ▶ **Modules, Modules, Modules!**
- ▶ **Shield Building Air Inlet Tension Ring and Roof Design**
- ▶ **Productivity**
- ▶ **Mechanical, Electrical and Instrumentation & Controls Installation**
- ▶ **Regulatory Compliance**
 - ▶ **License Amendment Requests (LARs)**
 - ▶ **ITAAC (873/unit required; 19 on U2 and 16 on U3 verified by NRC)**
- ▶ **Start-Up**
- ▶ **Operations and Support Staff Readiness**

Conclusions

G.J.E-Mails.2016.Vol.1.002356



- ▶ **Recent independent study indicates BLRA methodology reduces costs**
- ▶ **Still a diverse and non-GHG source of power**
- ▶ **Project faces significant, but not insurmountable, challenges**
- ▶ **Unit 3 will need substantial improvement in all areas to meet the date for federal tax credits**
- ▶ **Progress has been made in the general areas of the site and the turbine island**
- ▶ **Consolidation under Westinghouse is viewed positively by SCE&G**
- ▶ **Addition of Fluor should also be positive**



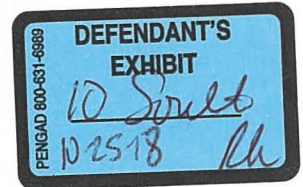
C. Dukes Scott
Executive Director

STATE OF SOUTH CAROLINA
OFFICE OF REGULATORY STAFF

1401 Main Street
Suite 850
Columbia, SC 29201

May 13, 2016

Mr. Kenneth R. Jackson
Senior Vice President
Economic Development, Government and Regulatory Affairs
SCANA Services, Inc.
220 Operation Way
Mail Code D309
Cayce, SC 29033-3701



Dear Mr. Jackson,

The following provides the ORS' comments and recommendations resulting from the site tour, meetings with senior site personnel, and document reviews performed at the VC Summer Units 2 & 3 construction site:

1. The ORS met with the lead Westinghouse Electric Company (WEC) project scheduling staff for the first time since Fluor became involved in the project. This meeting allowed the ORS to review the current revised integrated project schedule in more detail. The ORS now has a better understanding of the assumptions and bases of the schedule and the process of its development over the past few months. We learned that the initial schedule presented by WEC in August 2015 had arbitrarily held constraints that resulted in an unreliable and unrealistic depiction of the schedule for the remaining work. SCE&G and the on-site WECTEC project schedulers have worked to refine and accurately represent the remaining work and the logical ties among the work activities, as well as to reduce the number of arbitrary constraints. The ORS also obtained a better understanding of the documentation available to help us understand the schedule, including a more detailed Project Plan of the Day package. However, the ORS remains concerned that the schedule still needs refinement and has not yet received a complete detailed review and revision by Fluor that includes the resources needed to complete each task. This review will not be completed until the third quarter of this year. By that time, the ORS is concerned that additional delays may be identified in the project completion dates, especially on Unit 3.

The ORS also met with SCE&G staff who produced documents to support senior SCANA/SCE&G executives during negotiations with WEC that culminated in the October 2015

Phone: (803) 737-0805 ♦ Cell: (803) 463-6524 ♦ Fax: (803) 737-1900 ♦ Home: (803) 782-8547
E-mail: dukes.scott@regstaff.sc.gov ♦ Website: <http://www.regulatorystaff.sc.gov>

changes to the Engineering, Procurement, and Construction Contract Agreement (Amendment). This meeting provided additional insight into the financial basis of the final settlement and allowed ORS to gain a better understanding of the relationship between the project completion costs presented in the Amendment and those previously represented. However, costs shown in the Amendment are the result of a negotiation and do not represent a detailed accounting of the costs associated with each and every remaining project activity. Thus far, no rigorous and detailed comparative roll-up of the final costs is available. This presents a challenge as ORS evaluates and assesses the project costs presented in the Amendment.

2. With regard to construction progress on the project:

Positives

a. SCE&G completed the concrete fill within the walls of the Unit 2 CA20 structural module on April 5. As the first concrete fill of a major structural module on the site, completion of this item is a significant accomplishment.

b. All 17 submodules on Unit 2 CA03 are now standing upright on the plenum in the fabrication tent on site, and final welding and outfitting of the module are well underway. The module is on schedule for its placement in the containment vessel in June.

c. Newport News Industrial has made good strides in meeting their most recent schedules for delivery of Shield Building (SB) panels, and the erection of Course 4 of the SB panels has been completed at the construction site.

d. Progress has been made on the on-site fabrication of the Unit 3 CA20 module, subassemblies 1 & 2, in the Module Assembly Building (MAB) that supports a July 2016 placement date. All 72 submodules for this module have been delivered to the site, and subassemblies 3 & 4 have already been placed in the Unit 3 Auxiliary Building.

e. Progress was evident in the MAB on the Unit 3 CA01 module. Six submodules were erected on the plenum in a single week in April, which represents the highest production yet on this activity.

f. Unit 3 Containment Vessel (CV) Ring # 1 installation was completed on April 13.

Concerns

g. SCE&G received notification on April 21 from WEC of a quality issue with Mangiarotti components already delivered to the site. The issue involves 11 of the 26 sub-suppliers of safety-related pressure boundary materials and may impact the accumulator tanks, core make-up tanks, pressurizers, Passive Residual Removal heat exchangers, flued heads, and guard pipes. An action plan is due by May 31, and this issue may be a 10CFR Part 21 reportable infraction. This problem is significant because it may delay the installation of accumulator tanks. These tanks were due to be installed in the next couple of weeks and were to be the first major Nuclear Steam Supply System components installed in the plant.

h. The repairs to Turbine Building Bay 1 relating to an unacceptable concrete cold joint have been significantly delayed and are not progressing well. The hydro-lasing contractor is not meeting his promised productivity and may not be able to recover or improve. SCE&G is pursuing alternate paths to resolve this issue.

i. Progress on the Turbine Buildings continues to be significantly behind schedule (up to 6 months late in some cases), primarily due to craft labor shortages and diversion of labor to Nuclear Island work. SCE&G is working with Fluor and WECTEG to address this issue.

j. Continuing commodity shortages have resulted in delays. Fluor is to assume greater responsibilities in commodities purchasing and control, and SCE&G hopes to see improvements soon.

k. Construction labor productivity rates and overall productivity improvements have not yet significantly increased, although the activity levels have increased. Craft labor manpower increases will need to occur soon if there is to be a chance of meeting project completion dates. Process changes in several areas such as welding, procurement, and work-package preparation and closure will also soon need to be implemented to meet completion schedules.

l. Progress in completing the so-called "Reactor Containment" areas of the Unit 2 Auxiliary Building that support the SB panels has been problematic, primarily due to design changes and commodity shortages. This area is very near critical path and needs additional focus and effort.

m. Mechanical module delivery continues to fall behind schedule. As a result, SCE&G and WECTEG are considering moving fabrication to the site. While this may

improve quality and better support construction, it will increase the demands on craft labor on site, and may increase project costs.

More activity and project progress were visible and apparent during this site visit; however, challenges remain and the full benefits of the transition to the new contracting arrangements are yet to be realized.

Sincerely,



C. Dukes Scott

Cc: Byron W. Hinson, Director



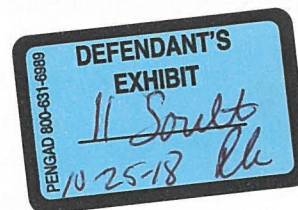
C. Dukes Scott
Executive Director

**STATE OF SOUTH CAROLINA
OFFICE OF REGULATORY STAFF**

1401 Main Street
Suite 850
Columbia, SC 29201

June 30, 2016

Byron W. Hinson, Director
Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way
MCCIII
Cayce, SC 29033-3701



Dear Byron,

The ORS is currently in a heightened state of concern regarding the construction cost overruns and schedule delays for W.C. Summer (VCS) Nuclear Units 2 & 3 (the Units).

Westinghouse and Fluor continue to struggle with craft labor productivity. While a slight improvement was shown during the first three months of Fluor's tenure on site, the most recent two months have trended negatively, with a performance factor now hovering around 2.0. This score indicates that only about half the work planned is being done for the labor hours expended. Furthermore, the project has not attained the improved productivity factor of 1.15 that formed the basis for the approved schedule and budget in Order No. 2015-661. Fluor's efforts to implement process changes through their Functional Area Assessments and subsequent improvement recommendations appear to be a step in the right direction; however, the assessments and the associated implementation of identified improvements are moving much too slowly. This effort needs to accelerate dramatically if the project is to meet its scheduled completion dates.

Fluor's recruitment efforts to increase craft labor are not meeting the targets required to support construction, and the year-end goal of increasing on-site craft labor by 1,000 is in jeopardy. Fewer applicants than needed are applying, and rejection rates are higher than expected due to a number of factors including lack of qualifications, failed background checks, and no-shows. Candidates are also taking other jobs they consider more attractive. In addition, the attrition rate among existing craft employees is higher than expected. The higher rate is due to terminations for continued absenteeism, resignations for other employment, and other factors. This shortage of labor also places the substantial completion dates in jeopardy.

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Although not yet reflected in the latest project progress reports, concern exists about the recent upturn in job-related injuries and incidents. In some instances, this trend appears to be the result of a declining safety culture attitude among the craft workers, along with uncertainty surrounding the new project management structure and the divisions of responsibility. Issues of this type have the very real possibility of resulting in a work stoppage and need to be immediately addressed and resolved.

The lack of availability of key commodities continues to plague the project and result in construction delays. Note that this issue is not tied to major components, as most of these are now on-site far ahead of their actual construction need date. The commodities in question are rebar, welding rod, standard structural steel, bolting, lubricants, steel plates, Nelson studs, and other standard construction commodities. These shortages are the result of Westinghouse's "just-in-time" approach to the ordering and delivery of these commodities. This approach has proved to be ineffective as the components are not available when required. On large construction projects, such commodities are routinely stocked in sufficient quantity to ensure they do not delay construction. Our consultant states that he has never worked on a nuclear project that was delayed by the lack of availability of standard rebar. At VCS, standard rebar unavailability has resulted in construction delays of critical path activities.

Other procurement issues, primarily associated with the negotiation of subcontracts and change orders, are becoming critical. Despite the fact that ten issues requiring change orders were identified in Exhibit C of the October 2015 Agreement, SCE&G and Westinghouse have been able to reach agreement on only a few of these issues in the intervening eight months. In addition, delays in the full authorization of several key subcontracts are putting the substantial completion dates of the project at risk.

Consistently meeting the construction schedule continues to be a significant issue for the project. This area must improve if any credibility is to be assigned to the current substantial completion dates and associated mitigation strategies that must be implemented in order to bring the plant to completion.

Module fabrication and delivery continue to drive the critical paths for the project; however, the focus is gradually shifting from structural modules to mechanical modules and structural steel modules in the Nuclear Island. In addition, the transition areas at the Shield Building to Auxiliary Building roof and the air inlet/tension ring areas of the upper Shield Building are becoming increasingly important. Contracts need to be finalized, and fabrication releases need to be expeditiously forthcoming in order to avoid schedule impacts. As it is, because these contracts have taken so long to be finalized, these items will be on a very tight schedule with little margin.

Concerns about the schedule also extend to the installation of components such as piping erection, cable raceway installation and cable pulling, instrumentation and tubing installation, HVAC equipment and ductwork installation, and wiring and termination. Historically, these areas have been the most difficult to complete when constructing nuclear power plants; however, very little of this effort has been completed on the Units. The modular construction methodology may

prove beneficial in this regard, but that remains to be seen. The tendency toward slow installation exhibited thus far is especially concerning in light of the project's inability to meet the construction schedule to date. Sustained installation rates will need to be demonstrated before the ORS has confidence in the project's ability to complete these areas in a timely manner.

Design changes continue to adversely affect fabrication and construction schedules. The number of design changes appears to be high considering the design completion status that the ORS understood in the early stages of the project. The factors driving these changes need to be further investigated, and additional management controls need to be established with the goal of reducing the frequency of design changes to only those that are absolutely required.

Operational readiness is also emerging as a concern. It is not clear at this point whether the required number of operations staff will be ready to perform the required testing and start-up support activities. The operational readiness schedule has not yet been incorporated into the integrated project schedule, so the true impact is not yet known. In addition, questions remain regarding the availability of the final Plant Reference Simulator in time to support operator training and procedure completion. Testing and operations procedure completion in time to support fuel load and commercial operation are also a concern.

In light of these concerns, ORS offers the following observations. SCE&G may benefit from evaluating a contract structure that provides the utility with more active involvement and control; rather than assigning all control to Westinghouse through the Option. The addition of Fluor as a subcontracted construction manager is a good step; however, Westinghouse still retains all control as the sole contractor. Consequently, Westinghouse controls the project budget, the majority of project procurement, and makes decisions about which methodology to use when problems arise. This is not an ideal arrangement. A better arrangement would include a contract that emphasizes partnership.

The process changes identified through Fluor's Functional Area Assessments need to be accelerated. If properly implemented, these changes should result in improved productivity by the workforce. In addition, the impact of these changes should be quickly assessed and any further improvements must be implemented expeditiously. The first priority should be the implementation of the so-called "Mini/Max" approach to purchasing commodities so that construction delays are not caused by the lack of construction commodities which are readily purchased.

The design change process also needs further management review and control. Changes should be assessed as to absolute need and impact on construction, and changes not meeting these requirements should not be implemented. SCE&G should be a part of this assessment process.

SCE&G and Westinghouse also need to come to an agreement on the milestone payment schedule soon. All necessary management and executive focus required to accomplish this goal must be utilized.

Any approach to this project that totally excludes Westinghouse is unlikely to be successful for the project. Westinghouse has key design responsibilities for all safety-related and almost all other key systems and components. In addition, they are the primary designers for the physical plant itself, including the structural and mechanical modules. Westinghouse must be a part of the

project if there is to be any hope of successfully completing it. In some areas, a more experienced architect/engineer might provide needed assistance which could be pursued in conjunction with Westinghouse. However, no successful scenario exists that totally excludes Westinghouse's participation.

In the case of Unit 2, ORS believes that, while the date in the filing of August 31, 2019 is unlikely to be met, it is possible that Unit 2 may still be able to qualify for the Federal Production Tax Credits that expire on December 31, 2020. However, completing Unit 2 in time to receive the Federal Production Tax Credits will require improvements to the current construction methodology.

For Unit 3, ORS has a much lower confidence level that this Unit can be completed within the 18 month window. ORS has no confidence that Unit 3 can meet the current Federal Production Tax Credit deadline of December 31, 2020. This finding is based on the lack of performance in multiple areas cited in the preceding section of this letter. In addition, Fluor has not completed their schedule assessment and has not prepared a resource loaded integrated project schedule. This makes the validity of the current schedule highly suspect.

Sincerely,



C. Dukes Scott
Executive Director